SUPER●®

SUPERSERVER 6113L-8
SUPERSERVER 6113L-i

USER'S MANUAL

1.0

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6113L-8/ 6113L-i. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6113L-8/6113L-i is a high-end, dual Itanium2 processor rackmount server based on the SC813HS-500/SC813Hi-500 1U rackmount server chassis and the i2DML-8G2/i2DML-iG2 serverboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the SUPER i2DML-8G2/i2DML-iG2 serverboard and the SC813HS-500/SC813Hi-500 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6113L-8/ 6113L-i into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6113L-8/6113L-i.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the i2DML-8G2/i2DML-iG2 serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the 1U SC813HS-500/SC813Hi-500 rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI/IDE or peripheral drives and when replacing the system power supply unit and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: BIOS POST Codes

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Chapter 1

Introduction

1-1   Overview

The Supermicro SuperServer 6113L-8/6113L-i is a high-end dual processor, 1U rackmount server that features some of the most advanced technology currently available. The SuperServer 6113L-8/6113L-i is comprised of two main sub-systems: the SC813HS-500/SC813Hi-500 1U rackmount chassis and the i2DML-8G2/i2DML-iG2 dual Itanium2 processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 6113L-8/6113L-i (www.supermicro.com).

In addition to the mainboard and chassis, various hardware components may have been included with your SuperServer 6113L-8/6113L-i, as listed below:

- Two (2) 1U Itanium2 CPU heatsinks (SNK-0046)

- One (1) heatsink retention socket with hex key (SKT-0147-RM-IT2)

- Two (2) power pods: Itanium2 voltage regulator modules (VRM-0008)

- One (1) slim CD-ROM drive (CDM-TEAC-24(B))

- One (1) riser card (CSE-RR1U-X)

- Four (4) Ultra320 SCSI drive carriers (CSE-PT-39(B), 6113L-8 only)

- Four (4) IDE drive carriers (CSE-PT-42(B), 6113L-i only)

- One (1) front access USB and COM port tray (CSE-PT40(B))

- Rackmount hardware (with screws):
  Two (2) rack rail assemblies
  Six (6) brackets for mounting the rack rails to a rack/telco rack

- One (1) CD-ROM containing drivers and utilities

- SuperServer 6113L-8/6113L-i User's Manual

Note: "(B)" indicates black.

1-2   Serverboard Features

At the heart of the SuperServer 6113L-8/6113L-i lies the i2DML-8G2/i2DML-iG2, a dual Intel Itanium2 processor serverboard designed to provide maximum performance. Below are the main features of the i2DML-8G2/i2DML-iG2.

Chipset

The i2DML-8G2/i2DML-iG2 is based on Intel's E8870 chipset, which is a high-performance chipset designed for high-end server platforms (see Figure 1-1).

The Intel 8870 chipset consists of the four primary components: the Scalable Node Controller (SNC), the Server I/O Hub (SIOH), the DDR Memory Hub (DMH), and the Scalability Port Switch (SPS). Complementary components include the I/O Hub Controller (Intel ICH4), the Firmware Hub (FWH), and the PCI Bus Bridge (P64H2).

The SNC is the main component in the processor/memory subsystem. It connects to four DDR memory hubs through four separate links to provide a peak memory bandwidth of 6.4 GB/s. Each DDR Memory Hub connects to two branch channels and supports up to four DDR SDRAM DIMMs per channel. The Scalability Port (SP) provides simultaneous, bi-directional signaling with an aggregate bandwidth of 6.4 GB/sec per port. Two SP ports per SNC provide a maximum bandwidth capability of 12.8 GB/s. The SNC delivers balanced, high-bandwidth throughput across the processors, memory and I/O.

The SIOH is the central component of the I/O subsystem and provides the connection between four Hub Interface 2.0 ports and two Scalability Ports. The the SIOH with four Hub Interfaces has a aggregate peak bandwidth of 4 GB/sec. The SIOH also offers a Hub Interface 1.5 connection to legacy I/O and firmware via the I/O Controller Hub (ICH4).

The DMH is a bridge for data transfers between the SNC and the two DDR memory channels. Each DMH has a maximum throughput of 1.6 GB/s and supports up to eight single or double density registered DIMMs.

The SPS is not used in the i2DML-8G2/i2DML-iG2.

Processors

The i2DML-8G2/i2DML-iG2 supports single or dual Intel Itanium2 processors of up to 1.50 GHz with a 6 MB L3 cache at a 400 MHz FSB. Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/support/).

Memory

The i2DML-8G2/i2DML-iG2 has eight 184-pin, DIMM slots that can support up to 16 GB of low-profile, registered ECC DDR200 (PC1600) SDRAM (DDR266 is supported but at 200 MHz only). Module sizes of 128 MB, 256 MB, 512 MB, 1 GB and 2 GB may be used to populate the DIMM slots. (This serverboard has has been designed to support 2GB DIMM modules for each memory slot, but it has only been validated with 1GB memory modules.)

PCI Expansion Slots

The i2DML-8G2/i2DML-iG2 has one 64-bit, 133/100 MHz PCI-X slot available for use in a 1U server configuration. A riser card is included with the server. This riser card fits into a PCI-X slot on the serverboard and was designed specially for the SC813HS-500/SC813Hi-500 chassis to support the use of one standard (full-length) PCI-X card.

ATI Graphics Controller

The i2DML-8G2/i2DML-iG2 features an integrated ATI video controller based on the Rage XL graphics chip. Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

Onboard Controllers/Ports

The i2DML-8G2 (only) includes an onboard LSI Ultra320 SCSI controller for dual-channel operation. Backpanel I/O ports on the 6113L-8/6113L-i include two COM ports, two USB ports and a VGA (monitor) port. An Intel 82546EB Ethernet controller provides support for two Gb LAN ports, which are also located on the backpanel.

Other Features

Other onboard features are included to promote system health. These include various voltage monitors, two CPU temperature sensors, four fan speed sensors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

Figure 1-1. E8870 Chipset Block Diagram
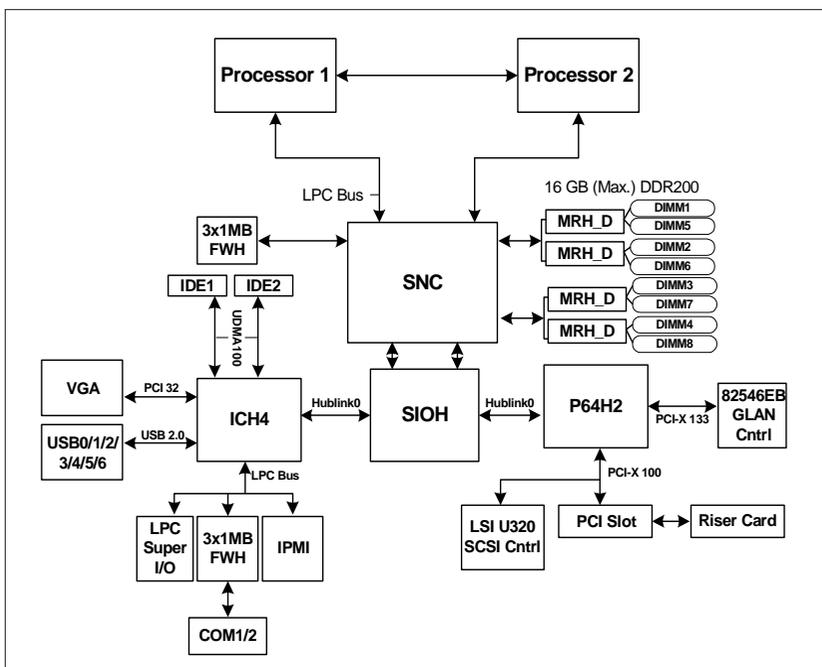
Note: This is a general block diagram. Please see the previous Serverboard Features pages for details on the features of each serverboard.

1-3 Server Chassis Features

The SC813HS-500/SC813Hi-500 is one of Supermicro's third-generation 1U chassis and features four SCSI/IDE hard drive bays, a slim CD-ROM drive and a revolutionary cooling design that can keep today's most powerful processors running well below their temperature thresholds. The following is a general outline of the main features of the SC813HS/SC813Hi-500 chassis.

System Power

When configured as a SuperServer 6113L-8/6113L-i, the SC813HS-500/SC813Hi-500 chassis includes a 500W cold-swap power supply.

Control Panel

The SC813HS-500/SC813Hi-500 control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and system overheat conditions. Also present are a main power button and a system reset button.

I/O Backplane

The SC813HS-500/SC813Hi-500 is a 1U rackmount chassis. Its I/O backplane provides one full-length PCI-X slot, a COM port (another COM port is an onboard header located near the USB2/3 ports), one VGA port, two USB ports and two Ethernet (LAN) ports. (See Figure 1-2.)

Figure 1-2. I/O Backplane
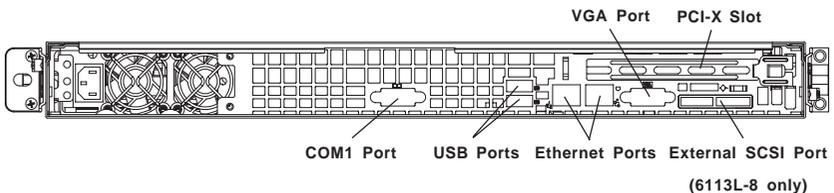
Cooling System

The SC813HS-500/SC813Hi-500 chassis' revolutionary cooling design has been optimized to provide sufficient cooling for dual Itanium2 configurations. The SC813HS-500/SC813Hi-500 includes two heavy duty 10-cm blower fans located in the middle of the chassis. These fans operate continuously at full rpm. If they break down, the ambient air temperature inside the chassis will rise and activate an overheat LED. In addition, a high-speed 4-cm fan is also included to increase the flow of cooling air through the system.

1-4   Contacting Supermicro

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Notes

Chapter 2

Server Installation

2-1   Overview

This chapter provides a quick setup checklist to get your SuperServer 6113L-8/ 6113L-i up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your SuperServer 6113L-8/6113L-i system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2   Unpacking the SuperServer 6113L-8/6113L-i

You should inspect the box the SuperServer 6113L-8/6113L-i was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6113L-8/6113L-i. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3   Preparing for Setup

The box the SuperServer 6113L-8/6113L-i was shipped in should include two sets of rail assemblies, six (four front and two rear) rail mounting brackets and screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

 Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

2-4   Installing the Server into a Rack

This section provides information on installing the SuperServer 6113L-8/6113L-i into a rack unit with the rack rails provided. If the 6113L-8/6113L-i has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly proce-dure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the SuperServer 6113L-8/6113L-i. Each of these assemblies consists of two sections: an inner fixed chassis rail that secures to the 6113L-8/6113L-i and an outer fixed rack rail that secures directly to the rack itself. A pair of short brackets to be used on the front side of the outer rails are also included.

Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.

Locking Tabs: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.
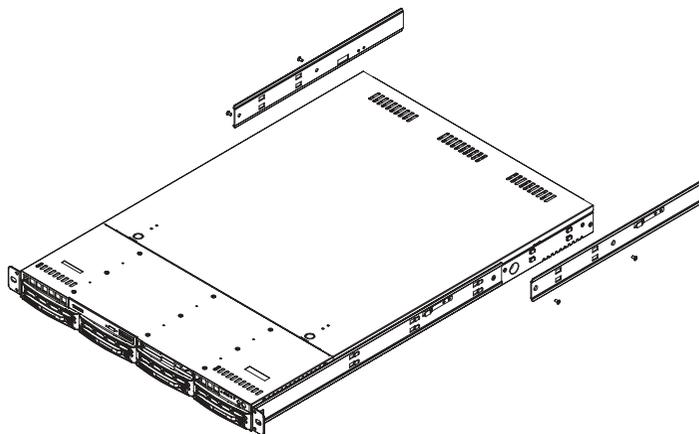
Figure 2-1. Installing the Rack Rails

Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-2.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

**Figure 2-2. Installing the Server into a Rack
(front bezel is optional)**
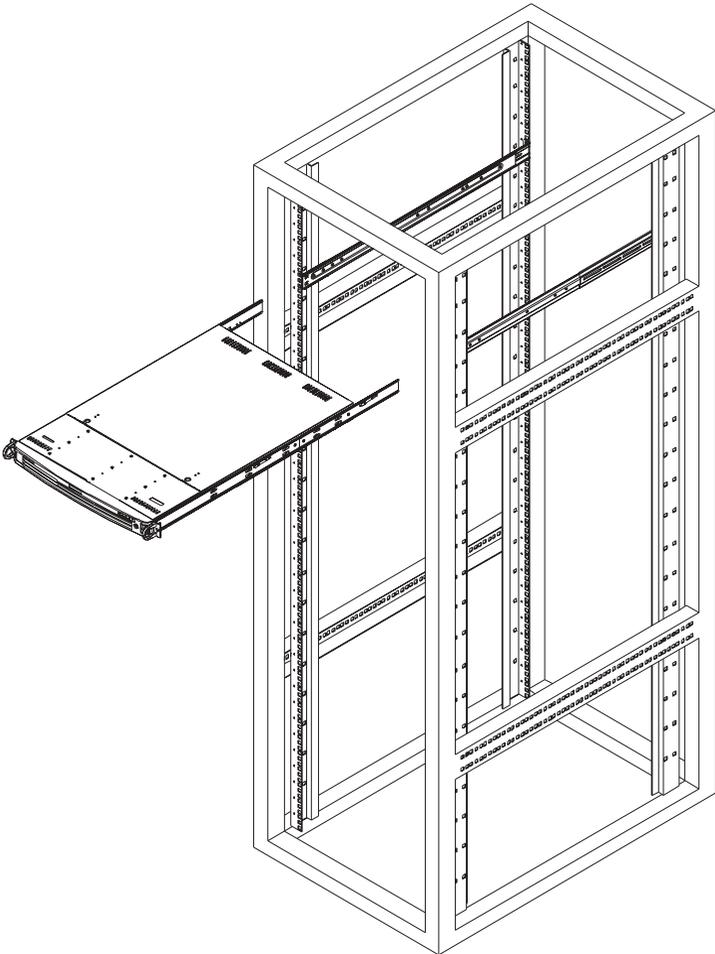
Installing the Server into a Telco Rack

If you are installing the SuperServer 6113L-86113L-8/6113L-i into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-3. Installing the Server into a Telco Rack (front bezel is optional)
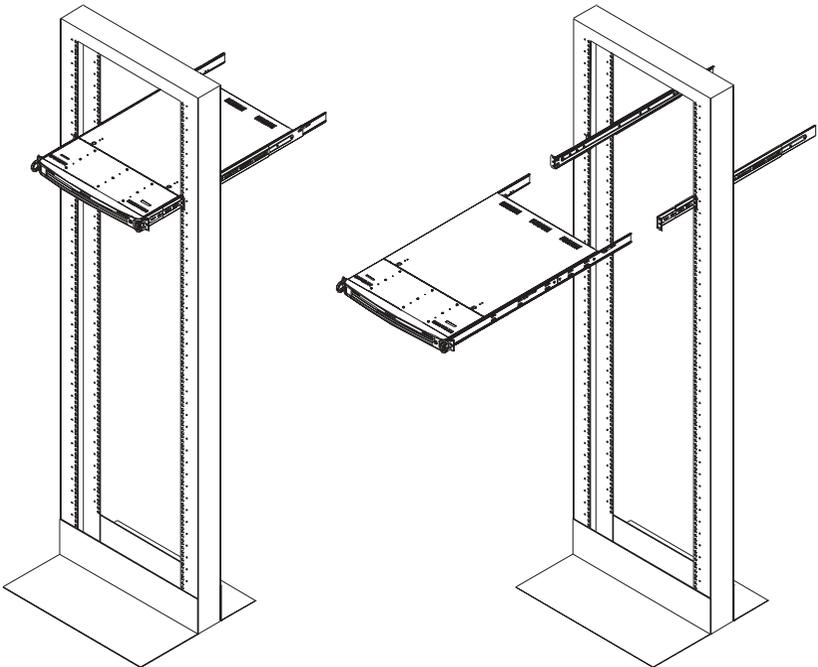
2-5   Checking the Serverboard Setup

After you install the 6113L-8/6113L-i in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

1. **Accessing the inside of the 6113L-8/6113L-i (see Figure 2-4):**

   First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover. There is a large rectangular recess in the middle front of the top cover to help you push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. **Check the CPUs (processors):**

   You may have one or two processors already installed into the serverboard. Each processor needs its own heatsink and power pod (VRM) installed. See Chapter 5 for instructions on processor and heatsink installation.

3. **Verify the proper CPU clock ratio setting:**

   If the CPU speed is not automatically detected you may need to set the correct speed with the BIOS Setup utility. See the appropriate setting in BIOS (Chapter 7) for setting the proper CPU speed. (Most processor speeds are automatically detected so this step should be unnecessary.)

4. **Check the system memory:**

   Your 6113L-8/6113L-i server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

5. **Installing add-on cards:**

   If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.
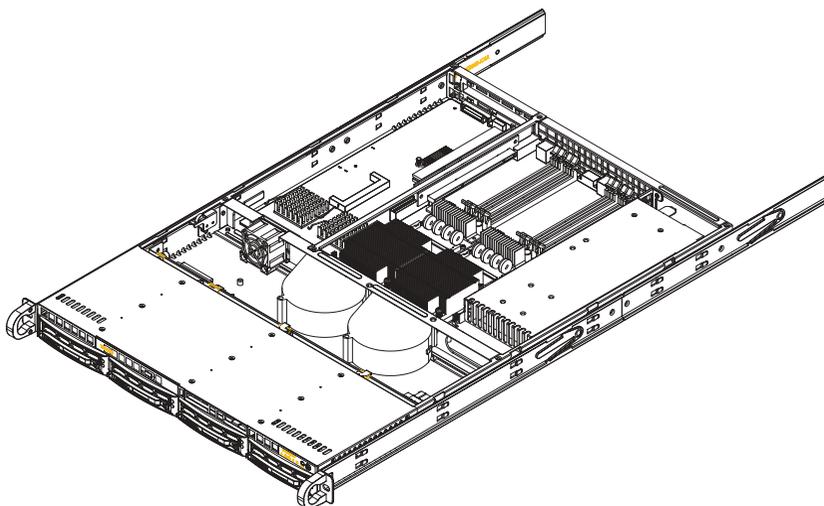
Figure 2-4. Accessing the Inside of the SuperServer 6113L-8/6113L-i

6. Check all cable connections and airflow:

Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

2-6   Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI/IDE drives have been properly installed and all connections have been made.

1. **Accessing the drive bays:**

    All drives are accessable from the front of the server. For servicing the CD-ROM and IDE drives, you will need to remove the top chassis cover (not necessary for SCSI drives). See Chapter 6 for details.

2. **CD-ROM drive:**

    A slim CD-ROM drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a CD-ROM drive to the system.

3. **Check the SCSI/IDE disk drives:**

    Depending upon your system's configuration, your system may have one or more SCSI (6113L-8) or IDE (6113L-i) drives already installed. If you need to install SCSI/IDE drives, please refer to Chapter 6.

4. **Check the airflow:**

    Airflow is provided by two heavy duty 10-cm blower fans and one high-speed 4-cm fan. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

5. **Supplying power to the system:**

    The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Notes

Chapter 3

System Interface

3-1   Overview

There are several LEDs on the chassis control panel to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2   Control Panel Buttons

There are two push-button buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

RESET

● **RESET:** The reset switch reboots the system.
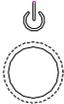
● **POWER:** This is the main power switch, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3   Control Panel LEDs

The control panel located on the front of th SC813HS-500/SC813Hi-500 chassis has four LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

● **OVERHEAT:** Indicates an overheat condition in the chassis. This may be caused by cables obstructing the airflow in the system, or the ambient room temperature being too warm. You should also check to make sure that the chassis cover is installed and that all fans are present and operating normally. Finally, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

NIC2

● **NIC2:** Indicates network activity on GLAN2 when flashing .

NIC1

● **NIC1:** Indicates network activity on GLAN1 when flashing.

● **HDD:** Indicates SCSI/IDE channel activity. On the SuperServer 6113L-8/ 6113L-i this light indicates SCSI/IDE and/or CD-ROM drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 SCSI Drive Carrier LEDs (6113L-8 only)

Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** A SAF-TE compliant backplane is needed to activate the red LED to indicate a drive failure. If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

Notes

Chapter 4

System Safety

4-1   Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself
from harm and the SuperServer 6113L-8/6113L-i from damage:

● Be aware of the locations of the power on/off switch on the chassis as well as
the room's emergency power-off switch, disconnection switch or electrical
outlet. If an electrical accident occurs, you can then quickly remove power
from the system.

● Do not work alone when working with high voltage components.

● Power should always be disconnected from the system when removing or
installing main system components, such as the serverboard, memory
modules and the CD-ROM drive (not necessary for the SCSI drives). When
disconnecting power, you should first power down the system with the
operating system and then unplug the power cords of all the power supply
units in the system.

● When working around exposed electrical circuits, another person who is familiar
with the power-off controls should be nearby to switch off the power if
necessary.

● Use only one hand when working with powered-on electrical equipment. This
is to avoid making a complete circuit, which will cause electrical shock. Use
extreme caution when using metal tools, which can easily damage any
electrical components or circuit boards they come into contact with.

● Do not use mats designed to decrease electrostatic discharge as protection
from electrical shock. Instead, use rubber mats that have been specifically
designed as electrical insulators.

● The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

● Serverboard Battery: CAUTION - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities. On the i2DML-8G2/i2DML-iG2, the positive side should be facing up. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

● CD-ROM Laser: CAUTION - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

4-2   General Safety Precautions

Follow these rules to ensure general safety:

● Keep the area around the SuperServer 6113L-8/6113L-i clean and free of clutter.

● The SuperServer 6113L-8/6113L-i weighs approximately 42 lbs (19.1 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

● Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

● While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

● Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

● After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3   ESD Precautions

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

● Use a grounded wrist strap designed to prevent static discharge.

● Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

● Touch a grounded metal object before removing any board from its antistatic bag.

● Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

● Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

● When handling chips or modules, avoid touching their pins.

● Put the serverboard and peripherals back into their antistatic bags when not in use.

● For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 6113L-8/6113L-i is operating to ensure proper cooling. Out of warranty damage to the 6113L-8/6113L-i system can occur if this practice is not strictly followed.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the i2DML-8G2/i2DML-iG2 serverboard, connect the data and power cables and in-stall add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. <u>Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.</u>

5-1   Handling the i2DML-8G2/i2DML-iG2 Serverboard

Static electrical discharge can damage electronic components. To prevent dam-age to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

5-2   Itanium2 Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heatsink.

To optimize the functionality and capability of the i2DML-8G2/i2DML-iG2, we recommend it be installed in Supermicro chassis only.

Warning: The heatsink on the MRH-D chip has been pre-installed by the manufacturer. Please do not touch it. Turning the heatsink the wrong way will damage it and will void the manufacturer's warranty.

Locating the Components

Locate the following components, which are included in the shipping package.

- Two (2) power pods (VRM-0008)

- Two (2) Itanium2 heatsinks (SNK-0046)

- One (1) heatsink retention package, which includes:
  One (1) heatsink retention mechanism (SKT-0147-RM-IT2)
  Eight (8) 5-mm M3 screws
  Three (3) 6-32, 4.5-mm screws
  Six (6) 6-32 9-mm screws
  One (1) M2.5 hex key (for CPU removal and locking)

Installing the Heatsink Retention Mechanism

1. Place the retention mechanism (SKT-0147-RM-IT2) on the serverboard as shown in the picture below:

2. Secure the retention mechanism to the serverboard by screwing three 6-32, 4.5-mm screws into the mounting holes on the back of the serverboard.

Figure 5-1. Installing Heatsink Retention Mechanism

1.) Place the retention mechanism on the serverboard.

2.) Screw in three 6-32 4.5-mm screws from the reverse side of the serverboard.
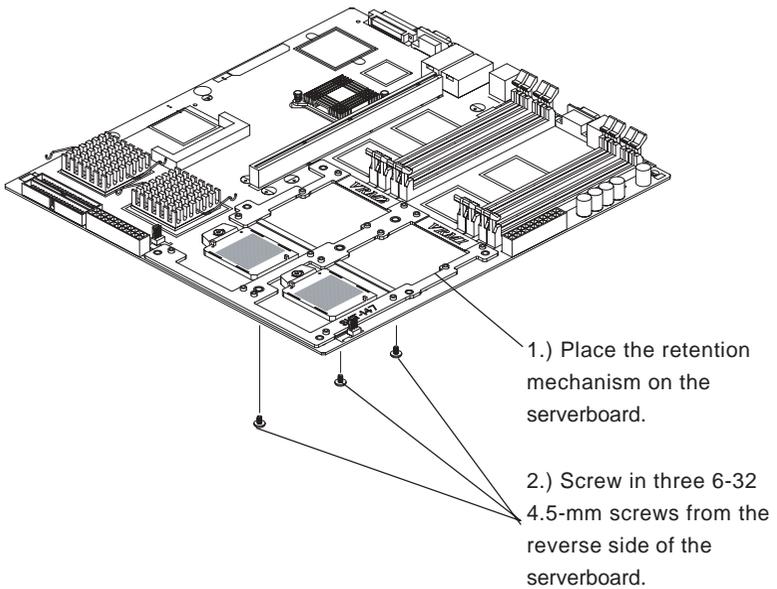
Installing Itanium2 CPUs

1. Insert an Itanium2 CPU into the CPU1 socket. Make sure that CPU Pin 1 is aligned with the cut angle of the CPU socket, as shown in the picture below.*

Itanium2 CPU   CPU1 Socket
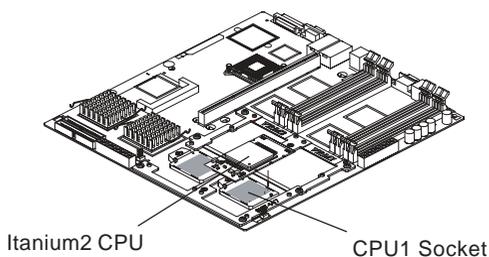
2. Use the M2.5 hex key to secure the Itanium2 CPU as shown in the picture below.

Securing the CPU with
    an M2.5 hex key
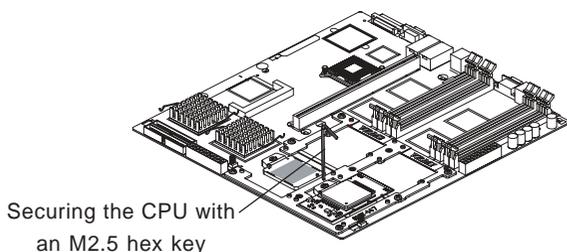
3. Make sure that the CPU is in its properly locked position. To lock it, use the M2.5 hex key to turn the lock in a clockwise direction. To unlock it, turn the lock in a counter-clockwise direction.

CPU-unlocked   CPU-locked

Pointer   **Pointer**
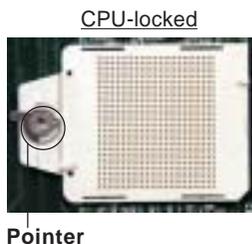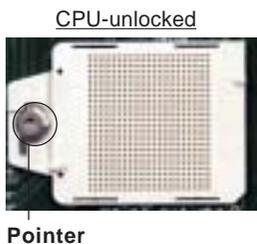
4. Repeat steps 1 and 2 to install a second Itanium2 CPU as needed.*

* Please refer to the serverboard layout page in this chapter for the locations of the CPU1 and CPU2 sockets.

Installing the Power Pods

The CPU power pod is a VRM mechanism specially designed for Itanium2 processors.

1. Locate the slot on the CPU power pod and align it with the Itanium2 CPU installed on the serverboard.

2. Carefully push the edge connector of the power pod toward the CPU until the signal pins on both edges of the CPU are fully seated in the edge connector and you hear a click.

Warning: If the signal pins of the CPU are not fully seated in the edge connector of the power pod, the CPU will not function correctly!!

CPU power pod

Power pod slot

Edge connector

Itanium2 CPU

Signal pins
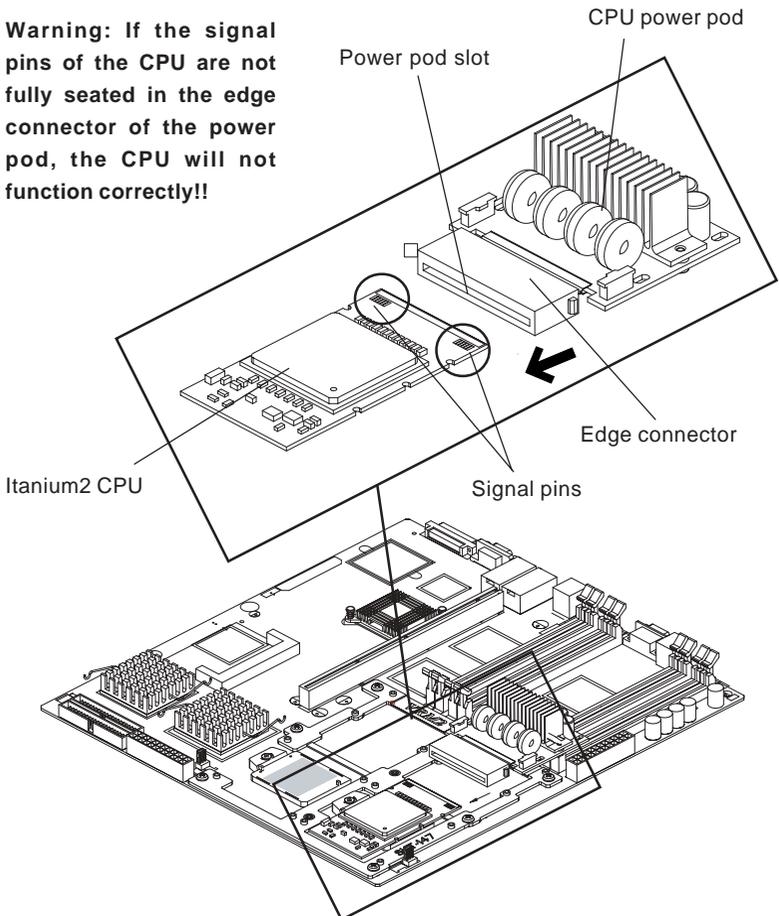
3. Locate four of the M3 screws in the heatsink retention package and use them to secure the power pod onto the serverboard as shown in the picture below.

Securing the power pod with four M3 screws.
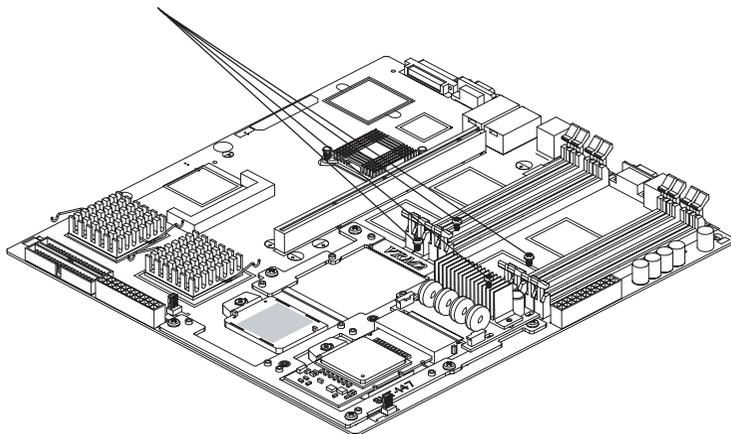
4. Repeat steps 1 and 2 to install a second power pod as needed.

Figure 5-2. Dual Itanium2 CPUs with Power Pods Installed
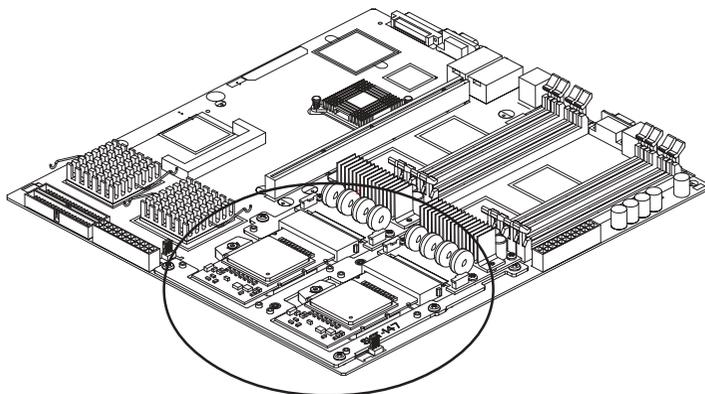
Installing Heatsinks (for CPUs without heatsinks)

Warning: Do not apply any thermal grease to the heatsink; the required amount of thermal grease has already been applied.

To maximizing the cooling effect of the i2DML-8G2/i2DML-iG2, we strongly recommend that Supermicro's proprietary heatsinks (SNK-0046) be used with Itanium2 CPUs.

1. Place a heatsink (SNK-0046) on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism as shown in Figure 1 below.

2. Screw in two diagonal screws (eg. the #1 and #2 screws) until just snug (do not fully tighten), then do the same with the remaining diagonal screws as shown in Figure 2 and Figure 3.

Figure 1

Mounting holes

Figure 2

Figure 3

NO.1 SCREW   NO.4 SCREW

NO.3 SCREW   NO.2 SCREW
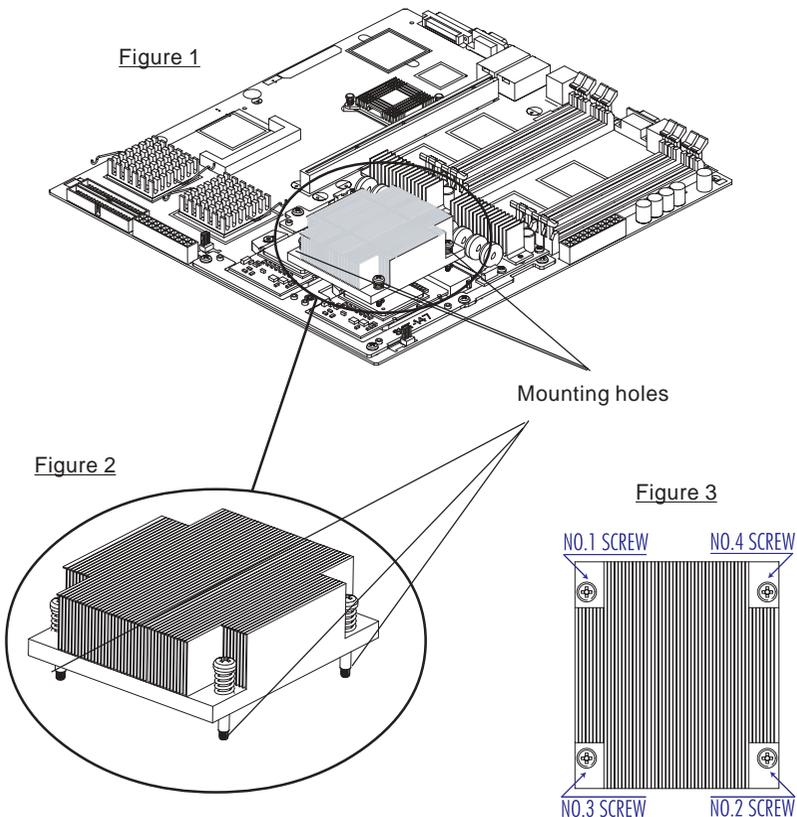
3. Secure the heatsink onto the CPU by tightening all four screws.

4. Repeat the above steps to install a second heatsink on a second CPU if needed.

Figure 5-3. CPUs (2) with Heatsinks Installed
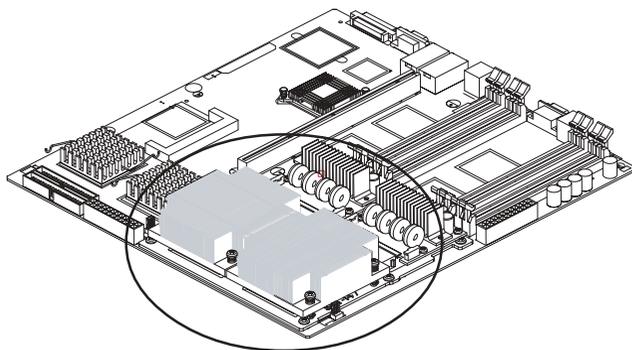
Connecting AC Power

1. Connect the 24-pin power connector from the AC power supply to the serverboard. See the serverboard layout diagram in this chapter for the locations of the power connectors.

2. Connect the two (2) 4-pin 12V power connectors from the AC power supply to the power pods.

3. Refer to the next section for details on all connections.

5-3   Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables. The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout figure in this chapter for connector locations.

- SCSI Device Cable (J3, 6113L-8 only)

- IDE Device Cable (J37, 6113L-i only)

- CD-ROM Cable (J35)

- Front Side COM Port Cable (J38)

- Front Side USB Cable (J21)

- Control Panel Cable (U66, see next page)

Connecting Power Cables

The i2DML-8G2/i2DML-iG2 has two 24-pin primary power supply connectors designated J20 and J36 for connection to the ATX power supply. Connect the appropriate connector from the power supply to the either of these two connectors (only one connection is required) to supply power to the serverboard. See the Connector Definitions section in this chapter for J20 and J36 pin definitions.

In addition, each processor requires a power pod. Each power pod must have power supplied to it via one of the 4-pin header connectors included with your power supply.

Connecting the Control Panel

The U66 header contains pins for various buttons and indicators that are normally located on the chassis control panel. These connectors are designed specifically for use with Supermicro server chassis. All U66 wires have been bundled into single ribbon cable to simplify their connection. The red wire should plug into pin 1 as marked on the serverboard. The other end connects to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the Connector Definitions section in this chapter for descriptions and pin definitions.

Figure 5-4. Front Control Panel Header Pins (U66)

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	Vcc
HDD LED	○	○	Vcc
NIC1 LED	○	○	Vcc
NIC2 LED	○	○	Vcc
Overheat LED	○	○	Vcc
Power Fail LED	○	○	Vcc
Ground	○	○	Reset → Reset Button
Ground	○	○	Pwr → Power Button
	2	1	
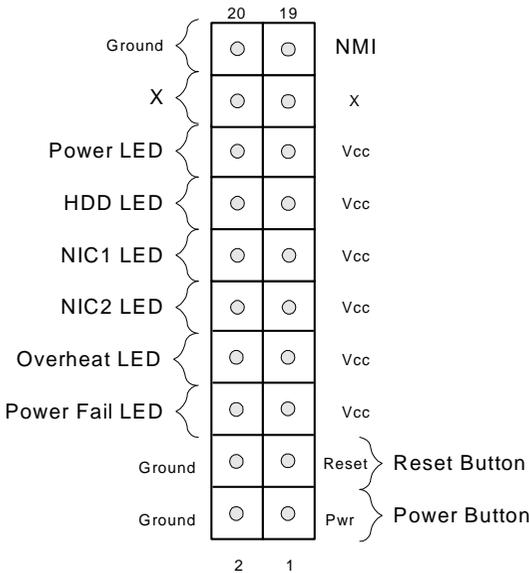
5-4   I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-5 below for the locations of the various I/O ports.

Figure 5-5. I/O Port Locations

COM Port   **USB Ports GLAN1 GLAN2**   **VGA Port**   **External SCSI (6113L-8 only)**

5-5   Installing Memory

Note: Check the Supermicro web site for recommended memory modules: http://www.supermicro.com/support/

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 5-6)

1. Insert four identical DIMMs (modules of the same size and type) into the DIMM1, DIMM2, DIMM3 and DIMM4 sockets (J16, J13, J11 and J9, repetively). (These four DIMM sockets are colored blue.) If eight DIMMs are to be used, insert four more identical DIMMs into the DIMM5, DIMM6, DIMM7 and DIMM8 sockets (J15, J14, J12, and J10, respectively). (These four DIMM sockets are colored black.)   The memory scheme is interleaved, so you must install four modules at a time, beginning with the blue DIMM1, DIMM2, DIMM3 and DIMM4 sockets.

2. Insert each DIMM module vertically into its socket. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

3. Gently press down on the DIMM module until it snaps into place in the socket. Repeat for all modules (see step 1 above).

Memory Support

The i2DML-8G2/i2DML-iG2 supports up to 16 GB of buffered, reistered ECC DDR200 (DDR266 memory can be used but will operate at DDR200 speed). This serverboard was designed to support 2 GB modules in each socket. You should not mix DIMMs of different sizes and speeds.

See Figures 5-6a and 5-6b for installing and removing memory modules.

Figure 5-6a. Side View of DIMM Installation into Socket
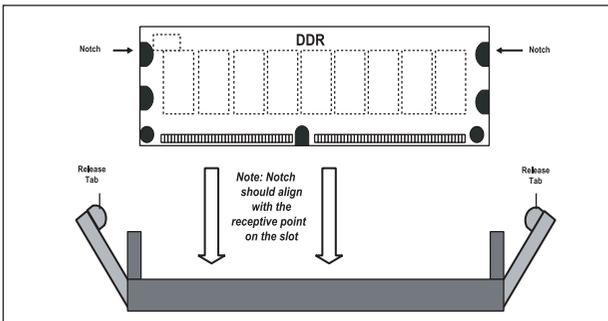
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the socket.

Figure 5-6b. Top View of DIMM Socket
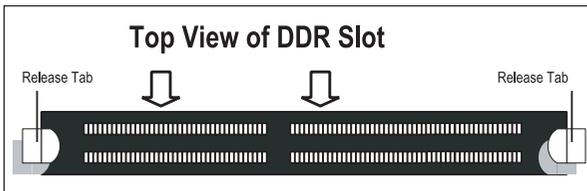
5-6   Adding PCI Cards

1.   PCI-X slot:

The i2DML-8G2/i2DML-iG2 has one 64-bit 133 MHz PCI-X slot. The server should have come with a riser card installed, which supports a standard sized PCI-X card (see Figure 5-7).

2.   PCI card installation:

Before installing a PCI add-on card, see step 1, above. Begin by swinging the release tab on the I/O backpanel shield out to the left for the PCI slot. Insert the PCI card into the correct slot on the butterfly riser card (depending on whether it is a standard or low-profile card), pushing down with your thumbs evenly on both sides of the card. Finish by pushing the release tab back to its original (locked) position. Follow this procedure when adding a card to either slot.

Figure 5-7. Low Profile vs. Standard PCI Card Form Factor
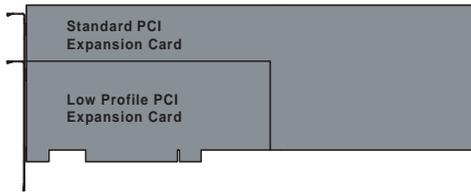
Standard PCI and Low Profile PCI Expansion Card Comparison

5-7   Serverboard Details

Figure 5-8. SUPER i2DML-8G2 Layout
(not drawn to scale)
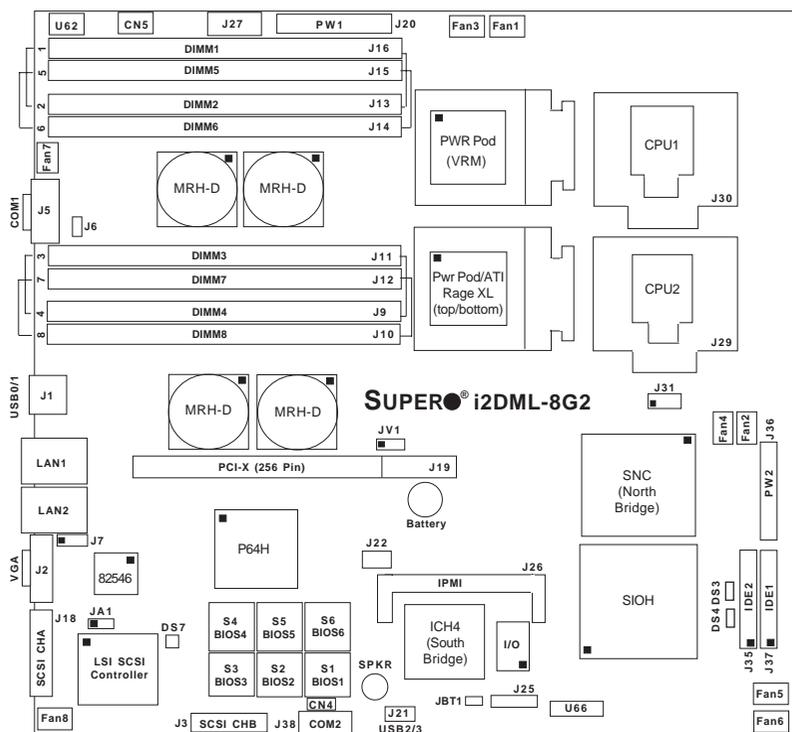
Notes:

Jumpers not indicated are for test purposes only.

" ■ " indicates the location of Pin 1.

The i2DML-iG2 shares the same layout but does not include an onboard SCSI controller, SCSI connectors or SCSI jumpers.

Warning:

The heatsink on the MRH-D chip has been pre-installed by the manufacturer. Please do not touch it. Turning the heatsink the wrong way will damage it and void the manufacturer's warranty.

i2DML-8G2/i2DML-iG2 Quick Reference

Jumper	Description	Default Setting
CN5	Power Fail Alarm Enable/Disable	Closed (Disabled)
J7	GLAN Enable/Disable	Pins 1-2 (Enabled)
J31	Watch Dog	Pins 1-2 (Reset)
JBT1	CMOS Clear	See Section 5-9
JA1*	SCSI Enable/Disable	Pins 1-2 (Enabled)
JV1	VGA Enable/Disable	Pins 1-2 (Enabled)

Connector	Description
DS3/DS4	Debug LEDs
DS7*	SCSI LEDs
Fan1 - 8	Fan1 through Fan8 Headers
J1	Backpanel USB Ports (USB0/1)
J2	VGA Connector
J3*	SCSI Channel B Connector
J5	COM1 Serial Port
J6	Wake-on-Ring Header
J9 - J16**	DDR Memory Sockets
J18*	SCSI Channel A Connector
J19	PCI-X Bus (256-Pin Slot)
J20	24-pin Power1 Connector
J21	Front Panel USB Ports (USB2/3)
J22	System Management Bus Connector
J25	Chassis Intrusion Header
J26	IPMI 1.5, 2.0 Connector
J27	System Management Bus Power Header
J30/J29	CPU 1/2 Sockets
J31	Watch Dog Reset
J36	24-pin Power2 Connector
J37/J35	IDE1/2 Disk Drive Connectors
J38	COM2 Serial Header
S1-6	BIOS Chips
U62	Power Fault Connector
U66	Front Control Panel Connector

* i2DML-8G2 only

** See Section 5-5 for details on installing memory

5-8   Connector Definitions

EPS 12V Power Connector

There are two 24-pin main power sup-
ply connectors on the serverboard.
These power connectors meet the
SSI EPS 12V specification. See the
table on the right for pin definitions.
(Only one of the two connections
need to be made.)

12V, 24-pin Power Supply Connector Pin Definitions (J20, J36)

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connectors

In addition to the primary power con-
nectors, a 4-pin EPS 12V/15A power
connector (from your power supply)
must be connected to each CPU
power pod (VRM). Refer to the table
on the right for pin definitions.

4-Pin, 12v Power Supply Connectors (to power pods)

Pins	Definition
1 thru 2	Ground
3 thru 4	+12v

Power Fail LED

The Power Fail LED connection is
located on pins 5 and 6 of U66. Refer
to the table on the right for pin defi-
nitions.

Power Fail LED Pin Definitions (U66)

Pin Number	Definition
5	Vcc
6	GND

NMI Button

The non-maskable interrupt button
header is located on pins 19 and 20
of U66. Refer to the table on the
right for pin definitions.

NMI Button Pin Definitions (U66)

Pin Number	Definition
19	Control
20	Ground

Power LED

The Power LED connection is lo-
cated on pins 15 and 16 of U66. Re-
fer to the table on the right for pin
definitions.

PWR_LED Pin Definitions (U66)

Pin Number	Definition
15	Vcc
16	Control

HDD LED

The HDD LED connection is located on pins 13 and 14 of U66. Attach the hard drive LED cable here to display disk activity for any hard drives on the system. See the table on the right for pin definitions.

HDD LED Pin Definitions (U66)

Pin Number	Definition
13	Vcc
14	HD Active

NIC1 LED

The NIC (Network Interface Controller) LED connection for the GLAN port is located on pins 11 and 12 of U66. Attach the NIC LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC LED Pin Definitions (U66)

Pin Number	Definition
11	Vcc
12	GND

NIC2 LED

The NIC (Network Interface Controller) LED connection for the GLAN port is located on pins 9 and 10 of U66. Attach the NIC LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC 2 LED Pin Definitions (U66)

Pin Number	Definition
9	Vcc
10	GND

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of U66 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (U66)

Pin Number	Definition
7	Vcc
8	GND

Reset Button

The Reset Button connection is located on pins 3 and 4 of U66. Attach it the hardware reset switch on the computer case to these pins. Refer to the table on the right for pin definitions.

Reset Pin Definitions (U66)

Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of U66. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the appropriate setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Connector Pin Definitions (U66)

Pin Number	Definition
1	PW_ON
2	Ground

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located on the backpanel. These are designated USB0/1. USB0 is the bottom connector and USB1 is the top connector of J1. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions

USB0		USB1	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

Front Panel Universal Serial Bus Header

Two extra USB headers (USB2/3 located at J21) can be used to provide front side USB access. You will need a USB cable to use either connection. Refer to the table on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions (J21)

Pin Number	Definition
1	+5V
2	P0-
3	P0+
4	Ground
5	Key

Serial Ports

There are two Serial Ports on the serverboard. The COM1 serial port (J5) is located on the back panel and the COM2 header (J38) is located near the USB 2/3 connector. See the table on the right for pin definitions.

Serial Ports Pin Definitions (J5, J38)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	DSR
2	Serial In	7	RTS
3	Serial Out	8	CTS
4	DTR	9	RI
5	Ground		

GLAN (Ethernet) Ports

Two G-bit Ethernet ports (designated LAN1 and LAN2) are located between USB0/1 ports and the VGA connector. These ports accept RJ45 type cables.

Chassis Intrusion

A Chassis Intrusion header (J25) is located near JBT1 on the serverboard. Attach the appropriate cable to inform you of a chassis intrusion. See the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (J25)

Pin Number	Definition
1	Instrusion
2	Ground

Fan Headers

The i2DML-8G2/i2DML-iG2 has eight fan headers, designated Fan1 through Fan8. See the table on the right for pin definitions.

Fan Header Pin Definitions (Fan1-Fan8)

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: Fan headers are DC power.

Power Fault

Connect a cable from your power supply to the U62 header to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin on U66 to indicate a power failure on the chassis. See the table on the right for pin definitions.

Note: This feature is only available when using redundant Supermicro power supplies.

Power Fault Pin Definitions (U62)

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

Wake-On-Ring

The Wake-On-Ring header is designated J6. This function allows your computer to receive and "wake-up" from an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (J6)

Pin Number	Definition
1	Ground
2	Wake-up

SMB

A System Management Bus header is located at J22. Connect the appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions (J22)

Pin Number	Definition
1	Data
2	Ground
3	Clock
4	No Connection

SMB Power (I²C) Connector

The I²C connector at J27, located between the PWR ForceOn Header and the PWR Fault header, monitors the status of the power supply, the fans, and the system temperature.

SMB PWR Pin Definitions (J27)

Pin #	Definition
1	Clock
2	Data
3	N/A
4	N/A
5	N/A

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout page for jumper locations.
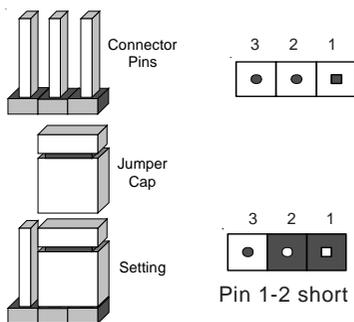
Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Connector Pins

Jumper Cap

Setting

Pin 1-2 short

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.
To clear CMOS, first power down the system, then
1) Unplug the power cord(s)
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver
3) Remove the screwdriver (or shorting device)
4) Reconnect the power cord(s) and power on the system.
Note: *Do not use the PW_ON connector to clear CMOS.*

VGA Enable/Disable

JV1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

**VGA Enable/Disable
Jumper Settings
(JV1)**

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

GLAN Enable/Disable

Change the setting of jumper J7 to enable or disable the onboard GLAN ports (GLAN1 and GLAN2) on the serverboard. See the table on the right for jumper settings. The default setting is enabled

GLAN Enable/Disable Jumper Settings (J7)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

J31 controls Watch Dog, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will have WD reset the system if a program freezes. Jumping pins 2-3 will generate a non-maskable interrupt for the program that has frozen (requires software implementation). <u>Watch Dog must also be enabled in BIOS.</u>

Watch Dog Jumper Settings (J31)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Power Fail Alarm Enable/ Disable

The system will notify you in the event of a power supply failure. This feature assumes that redundant Supermicro power supply units are installed in the chassis. If you only have a single power supply installed, you should disable this (the default setting) with CN5 to prevent false alarms. See the table on the right for jumper settings.

Alarm Reset Jumper Settings (CN5)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

SCSI Enable/Disable (6113L-8 only)

The SCSI jumper at JA1 allows you to enable or disable the onboard SCSI controller. The normal (default) position is on pins 1-2 to enable SCSI termination. See the table on the right for jumper settings.

SCSI Enable/Disable Jumper Settings (JA1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-10 Onboard Indicators

GLAN LEDs

Each of the Gigabit Ethernet LAN ports (located beside the COM2 port on the back panel) has two LEDs. The yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table at right for the functions associated with the second LED.

Gb LAN Right LED Indicator

LED Color	Definition
Off	No Connection
Green	100 Mb
Orange	1 Gb

Debug LEDs

There are two debug LEDs located next to the IDE 2 Connector to indicate common debug messages. See the table below for the functions associated with the debug LEDs.

Debug LED Indications (DS3, DS4)

DS3	DS4	Indication
On	On	SNC found and start memory sizing
Off	On	Initial system memory and SIOH
On	Off	Valid memory and SIOH found
Off	Off	ICH4 found

**SCSI Activity LED
(6113L-8 only)**

The SCSI Activity LED is located next to the LSI SCSI controller. When the SCSI Activity LED blinks, it indicates that one or both of the SCSI channels are active.

5-11 SCSI and IDE Disk Drive Connections

When connecting the hard disk drive cables, please note that a red mark on a wire typically designates the location of pin 1.

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors. See the table below for pin definitions.

**IDE Connector Pin Definitions
(J37, J35)**

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

Ultra320 SCSI Connectors
(6113L-8 only)

Refer to the table below for the pin definitions of the Ultra320 SCSI connectors at J18 (SCSI channel A and J3 (SCSI channel B).

68-pin Ultra 320 SCSI Connectors (J3 and J18)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC813HS-500/SC813Hi-500 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required
The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1   Static-Sensitive Devices

Electricstatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.
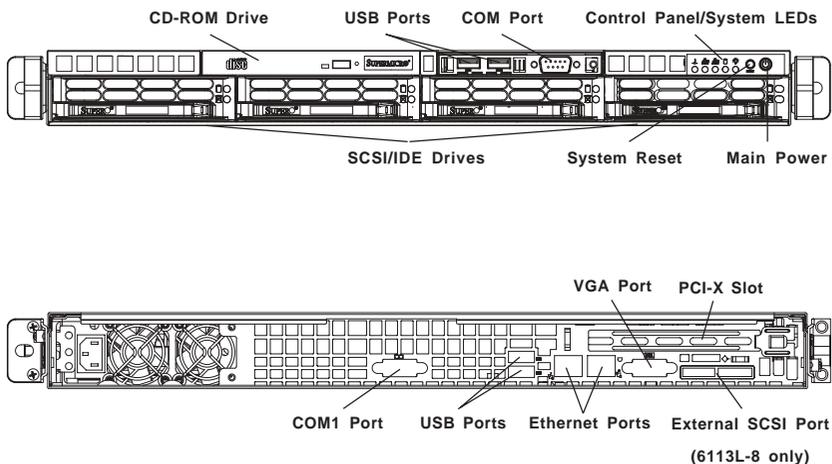
CD-ROM Drive   USB Ports   COM Port   Control Panel/System LEDs

SCSI/IDE Drives   System Reset   Main Power

VGA Port   PCI-X Slot

COM1 Port   USB Ports   Ethernet Ports   External SCSI Port

(6113L-8 only)

Figure 6-1. Chassis: Front and Rear Views

6-2   Control Panel

The control panel (located on the front of the chassis) must be connected to the JF2 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF2 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF2 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3 System Fans

Two 10-cm blower fans and a high-speed 4-cm fan provide all the cooling needed for the SuperServer 6113L-8/6113L-i. It is very important that the chassis top cover is properly installed and making a good seal for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

If a fan fails, the ambient air temperature in the chassis will rise and activate the overheat LED on the control panel. Replace any failed fan immediately with the same type and model. You must power down the system before replacing any fan (removing the power cord is also recommended as a safety precaution).

Replacing System Fans

1.   Removing a 10-cm fan:
After turning off the power to the system, first remove the chassis cover and unplug the fan cable from the serverboard. Unscrew the failed blower fan from the chassis and pull it completely out of the chassis.

2.   Installing a new 10-cm fan:
Replace the failed fan with an identical 10-cm, 12 volt fan (available from Supermicro, p/n FAN-0059). Install the new fan in its proper place in the chassis by positioning it on the two mounting posts. Secure the fan to the chassis with the screws you removed previously, then attach the fan wires to the correct chassis fan header. Make sure the air seal under the fan is properly installed and creating a good seal. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

3.   Removing a 4-cm fan:
After turning off the power to the system, first remove the chassis cover and unplug the fan cable from the serverboard. Unscrew the fan and then remove it from the chassis.

4.   Installing a new 4-cm fan:
Replace the failed fan with an identical 4-cm fan (available from Supermicro, p/n FAN-0061). Install the new fan in the same position as the failed one you just removed and secure it with the screws you removed previously. Attach the fan wires to the correct chassis fan header then power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

10-cm Blower Fans
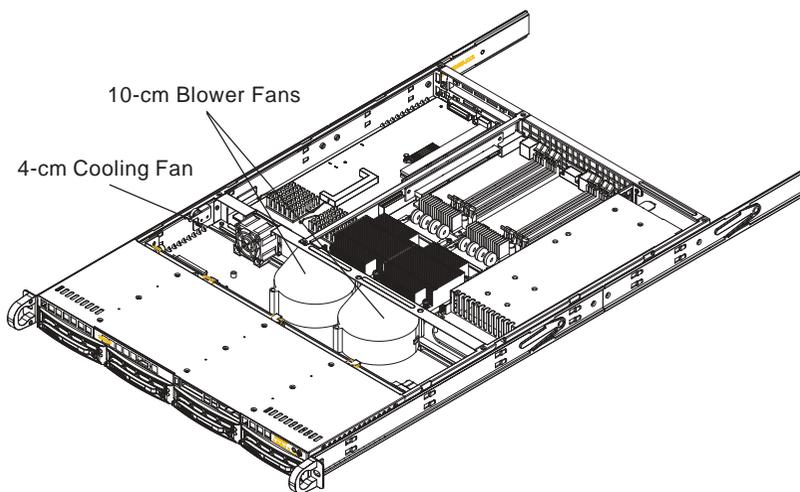
4-cm Cooling Fan

Figure 6-2. System Cooling Fans

6-4   Drive Bay Installation/Removal

Removing the Front Bezel

If your system has a front bezel (optional) attached to the chassis, you must first remove it to gain access to the drive bays. To remove the bezel, first unlock the front of the chassis then press the release knob (see Figure 6-3). Carefully remove the bezel with both hands. A filter located within the bezel can be removed for replacement/cleaning. It is recommended that you keep a maintenance log of filter cleaning/replacement, since its condition will affect the airflow throughout the whole system.

Figure 6-3. Removing the Front Bezel

1. Unlock
2. Press release knob
3. Remove bezel assembly
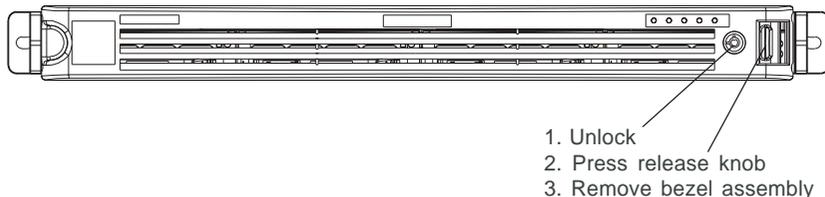
Accessing the Drive Bays

SCSI/IDE Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SCSI drives. Proceed to the next step for instructions. (For installing/removing IDE drives, you do not need to access the inside of the system but you will need to remove power from the system first.)

CD-ROM Drive: For installing/removing a CD-ROM drive, you will need to gain access to the inside of the 6113L-8/6113L-i by removing the top cover of the chassis. Proceed to the "CD-ROM Drive Installation" section later in this chapter for instructions.
Note: Only a "slim" CD-ROM drive will fit into the 6113L-8/6113L-i.

SCSI/IDE Drive Installation

1.   Mounting a SCSI/IDE drive in a drive carrier:
The SCSI/IDE drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the SCSI/IDE drive bays. For this reason, even empty carriers without SCSI/IDE drives installed must remain in the chassis. To add a new SCSI/IDE drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-4.
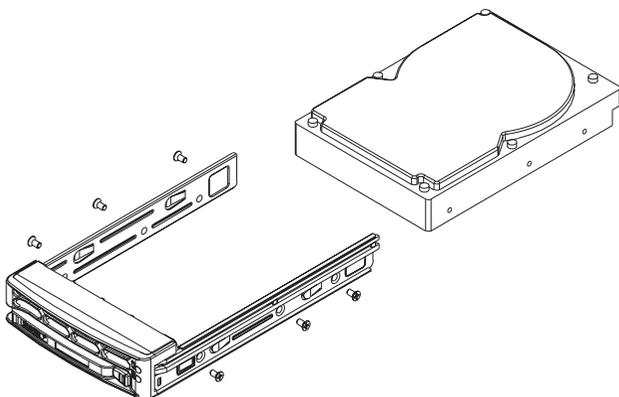
Figure 6-4. Mounting a SCSI/IDE Drive in a Carrier

![warning triangle] **6113L-8 only: Use caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.**

![warning triangle] **Important: Regardless of how many SCSI/IDE hard drives are installed, all SCSI/IDE drive carriers must remain in the drive bays for proper airflow.**

2.   Installing/removing hot-swap SCSI drives (6113L-8 only):
The SCSI drive bays are located in the front of the chassis, making them easily accessible for installation and removal. The SCSI drives are hot-swap units, meaning that they can be installed and removed while the system is running. To remove a SCSI drive, first push the colored release button located beside the drive's LEDs, then swing the handle fully out and use it to pull the SCSI drive carrier straight out (see Figure 6-5).

Figure 6-5. Removing SCSI Drives
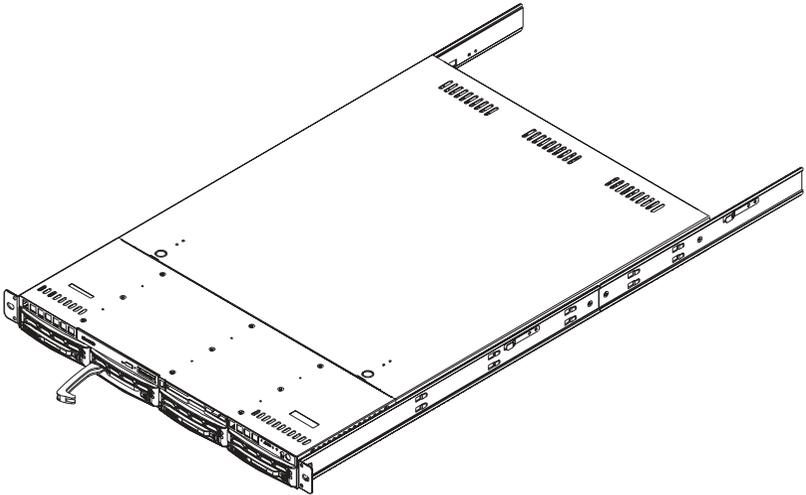
Important: All of the SCSI drive carriers must remain in the drive bays to maintain proper cooling airflow.

CD-ROM Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM drive bay. The 6113L-8/6113L-i accomodates only slim CD-ROM drives. Side mounting brackets are needed to mount a slim CD-ROM drive in the 6113L-8/6113L-i server.

You must power down the system before installing or removing a CD-ROM drive. First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

With the chassis cover removed, unplug the power and data cables from the drive. Then locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis. Pull the tab away from the drive and push the drive unit out the front of the chassis. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system.

6-5   Power Supply

The SuperServer 6113L-8/6113L-i has a single 500 watt power supply, which is auto-switching capable. This enables it to automatically sense and operate with either a 100v or 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the unit. Replacement units can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply unit in the 6113L-8/6113L-i, power must be completely removed from the server before removing and replacing the power supply unit for whatever reason.

Removing/Replacing the Power Supply

1.   Removing the power supply:
First turn the power switch on the control panel off, then unplug the power cord from the system. Remove the chassis cover by pressing the two release buttons on the top of the chassis (near the front) and push the chassis top rearward about one inch. To remove the failed power unit, push the beige colored release tab to the right and then carefully lift the unit up about 1/2 inch only. If you lift too high, you may damage the power distribution board that the other end of the unit is connected to. Then, pull the power unit straight back to unplug it from the power distribution board. See Figure 6-6.

2.   Installing a new power supply:
Replace the failed unit with another unit of the same input voltage, output voltage and wattage. It is highly recommended to replace it with exactly the same model power supply (Supermicro part number: PWS-0048).
Carefully insert the new unit into position to plug it into the power distribution board, making sure you are not holding it at too great an angle, which may damage the power distribution board. Push it completely into the power distribution board and seat it in the chassis. When correctly installed it should be laying flat - make sure the end of the power supply is not sitting on the stop in the chassis. Reconnect the power cord, replace the chassis top cover and reposition the unit back into the rack. Finish by depressing the power button on the chassis front control panel.
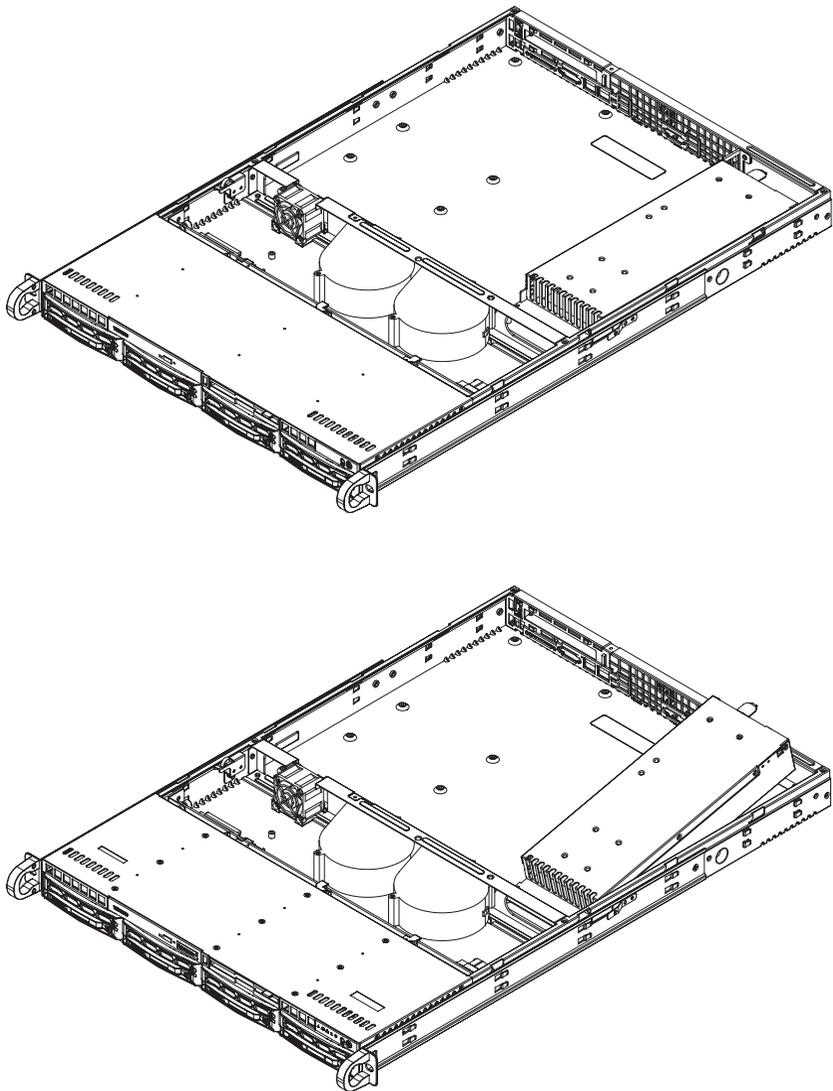
Figure 6-6. Removing/Replacing the Power Supply

Chapter 7

BIOS

7-1   Introduction

This chapter describes the AMIBIOS settings for the i2DML-8G2/i2DML-iG2. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily upgraded using a floppy disk-based program.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1> or <F2>.)

Each BIOS menu option is described in this chapter. The BIOS setup menu screen has two main frames. The left frame displays all the setting options; "grayed-out" options cannot be configured while those in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message to describe the highlighted setting. (AMIBIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.) When an option is selected in the left frame, it is highlighted in white. Press the <Tab> key or the <Arrow> keys to move between fields. Certain "hot keys" may also be used. Most of the BIOS these hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.

Options printed in **Bold** are default settings.

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 7-3 gives detailed descriptions of each parameter setting in the Setup utility.

An AMIBIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

7-2   Main Setup Screen

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the *Main* tab on the top of the screen. The Main BIOS Setup screen is shown below.
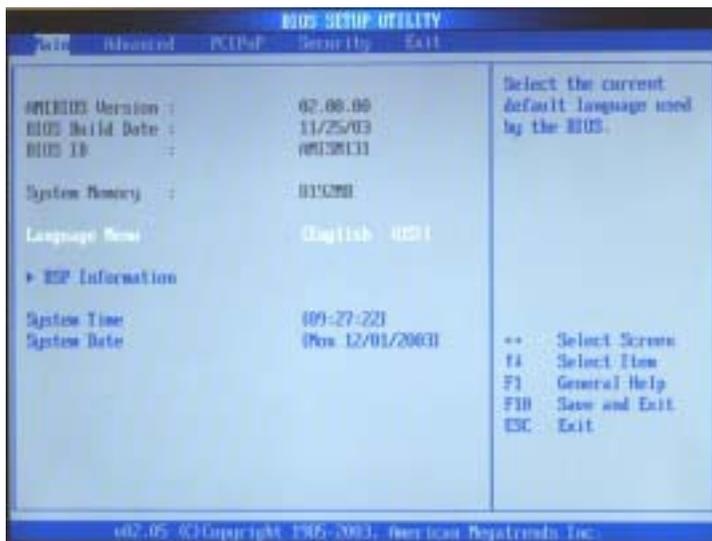
When you select the Main Setup, the AMI BIOS Version, BIOS Build Date, BIOS ID and System Memory will all be displayed.

Language Menu

This option allows you to set the default Language used by the BIOS.
Select English (US) if you wants to use English as your default Language.

BSP Information

When you select this option, AMI BIOS will automatically display the status of each of the following items: BSP Type, BSP Speed, BSP CPU1 ID, BSP CPU2 ID, BSP L1 Cache, BSP L2 Cache and BSP L3 Cache.

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format.（The time follows the 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.)

7-3   Advanced Setup Screen

Selecting the *Advanced* tab takes you to the Advanced setup screen. The Advanced BIOS Setup screen and sub menus are listed below:
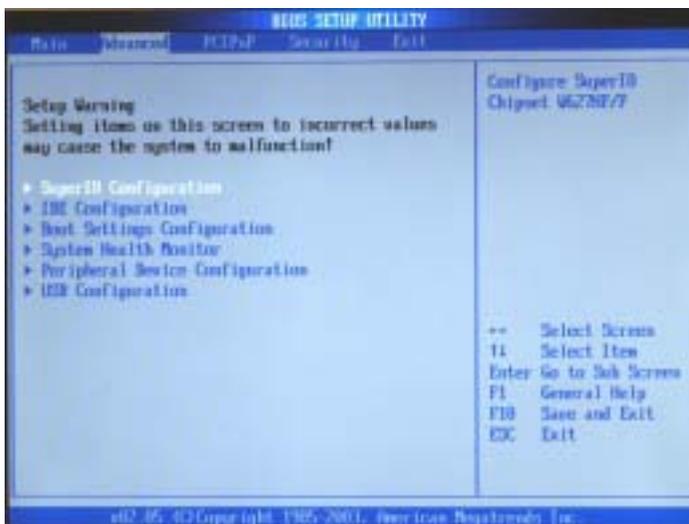
When you first enter the Advanced Setup screen, the Setup Warning will be displayed. Please follow the instructions and set the correct value for each item to prevent the system from malfunctioning.

▶**Super IO Configuration**
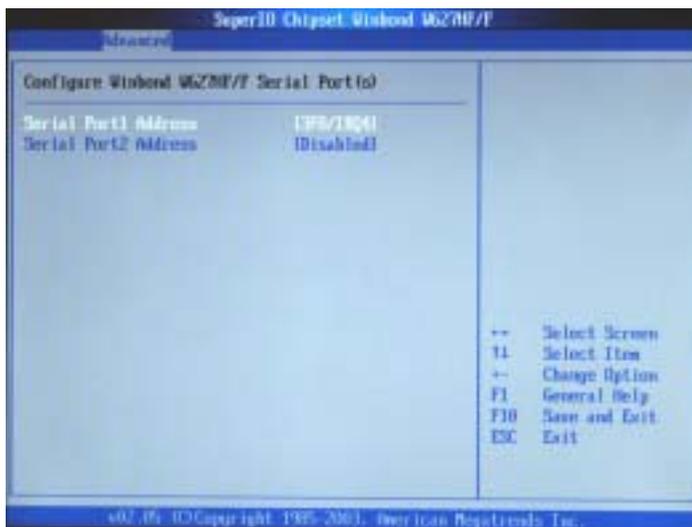
Serial Port1 Address/Serial Port2 Address

This option specifies the base I/O port addresses and Interrupt Request addresses of Serial Port 1 and Serial Port2. Select "Disabled" to prevent the serial ports from accessing any system resources. When this option is set to Disabled, the serial ports become physically unavailable.   The options are "Enabled" and "Disabled." The default setting for Serial Port1 is "**Enabled**". When "Enabled" is selected for Serial Port1, the address for Serial Port1 will be automatically set to **2F8/IRQ3**. The default setting for Serial Port2 is "**Disabled**". When "Disabled" is selected for Serial Port2, Serial Port2 will become physically unavailable.

▶**IDE Configuration**

The screen for the Primary IDE Master is shown below.
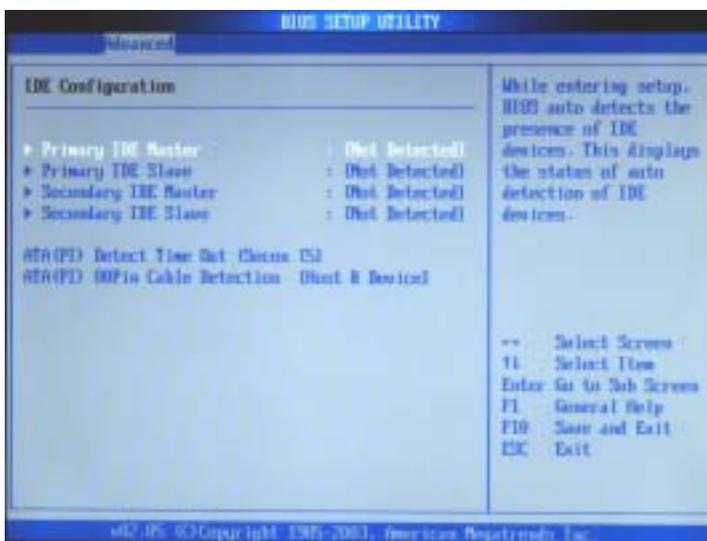
When you select this Sub Menu, AMI BIOS automatically displays the status of the following items: Device, Vendor, Size, LBA Mode, PIO Node, Asynch DMA, UltraDMA and S.M.A.R.T.

Primary IDE Master/Slave, Secondary IDE Master/Slave

From the Advanced Setup screen, press <Enter> on the appropriate option to access primary and secondary IDE master and slave drives submenu. Use this screen to select options for the Primary and Secondary IDE drives. Use the up and down <Arrow> keys to select an item and the <Plus> and <Minus> keys to change the value of the selected option.

Type

Select the type of device connected to the system. The options are "Not Installed", "**Auto**", "CDROM" and "ARMD".

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are "Disabled" and "**Auto**".

Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "Auto" to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are "**Auto**" and "Disabled".

PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are "**Auto**", "0", "1", "2", "3" and "4". Select Auto for BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 for BIOS to use PIO mode 0, 1 for PIO mode 1, 2 for PIO mode 2, 3 for PIO mode 3 or 4 for PIO mode 4. These settings have data transfer rates of 3.3 MBs, 5.2 MBs, 8.3 MBs, 11.1 MBs and 16.6 MBs, respectively. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Select the default setting of **Auto** to allow the BIOS to auto detect the DMA mode. Use this value if the IDE disk drive support cannot be determined. Otherwise, select from one of the following options: SWDMA0 (Single Word DMA mode 0, 2.1 MBs data transfer rate), SWDMA1 (Single Word DMA mode 1, 4.2 MBs data transfer rate), SWDMA2 (Single Word DMA mode 2, 8.3 MBs data transfer rate), MWDMA0 (Multi Word DMA mode 0, 4.2 MBs data transfer rate), MWDMA1 (Multi Word DMA mode 1, 13.3 MBs data transfer rate), MWDMA2 (Single Word DMA mode 2, 16.6 MBs data transfer rate), UDMA0 (Ultra DMA mode 0, 16.6 MBs data transfer rate), UDMA0 (Ultra DMA mode 0, 16.6 MBs data transfer rate), UDMA1 (Ultra DMA mode 1, 25 MBs data transfer rate), UDMA2 (Ultra DMA mode 2, 33.3 MBs data transfer rate), UDMA3 (Ultra DMA mode 3, 66.6 MBs data transfer rate) or UDMA4 (Ultra DMA mode 4, 100 MBs data transfer rate).

S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "**Auto**" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent the BIOS from using the S.M.A.R.T. Select "Enabled" to allow the BIOS to use the S.M.A.R.T. to support hard drive disk.

32-Bit Data Transfer

Select "**Enabled**" to activate the 32-Bit data transfer function. Select "Disabled" to deactivate the function.

ARMD Emulation Type

This feature allows the BIOS to set the ARMD Emulation type. The options are **"Auto"**, "Floppy" and "Hard Disk."

ATA(PI) Detect Time Out

The feature allows BIOS to set the time out value for detecting ATA(PI) devices. The options are "0", **"5"**, "10", "15", "20", "25" and "30."

ATA(PI) 80-Pin Cable Detection

This feature allows the BIOS to auto-detect the 80-pin ATA(PI) Cable. The options are **"Host & Device"**, "Host" and "Device."

▶**BIOS Settings Configuration**

This item allows the user to configure the system's boot settings.


Quiet Boot

Set this value to allow the boot up screen options to be modified between POST messages or OEM logo. Select **Disabled** to allow the computer system to display the POST messages. Select Enabled to allow the computer system to display the OEM logo.

▶System Health Monitor

This feature allows the BIOS to automatically display the status of the following items: CPU Overheat Temperature, CPU1/CPU2 Temperature, various voltage levels and fan speeds. See screen shot below.
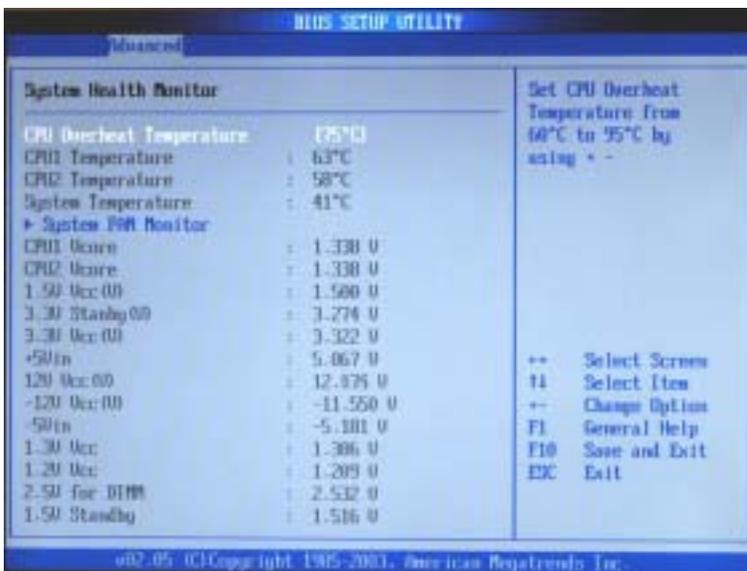
▶Peripheral Device Configuration

This screen allows the user to configure the Peripheral Device settings
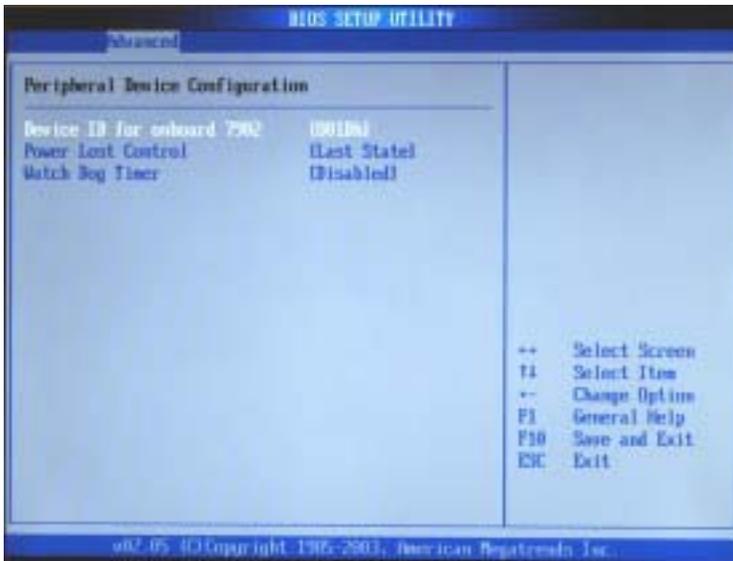
Power Loss Control

This setting allows you to choose how the system will react when power is returned to the system after being unexpectedly lost. Options are "Stay Off", "Power On" and "**Last State**."

Watch Dog Timer

This setting is used to enable or disabled the Watch Dog Timer function. It must be used in conjunction with the J31 jumper (see Chapter 2 for details). Options are "Enabled" and "**Disabled**."

Watch Dog Timer Value

If the function of Watch Dog Timer (above) is enabled, this feature will allow the user to value for the Watch Dog Timer. Options are "2 Min(utes)", "**5 Min.**", "10 Min." and "15 Min."

▶USB Configuration

This feature allows the user to configure the USB settings.
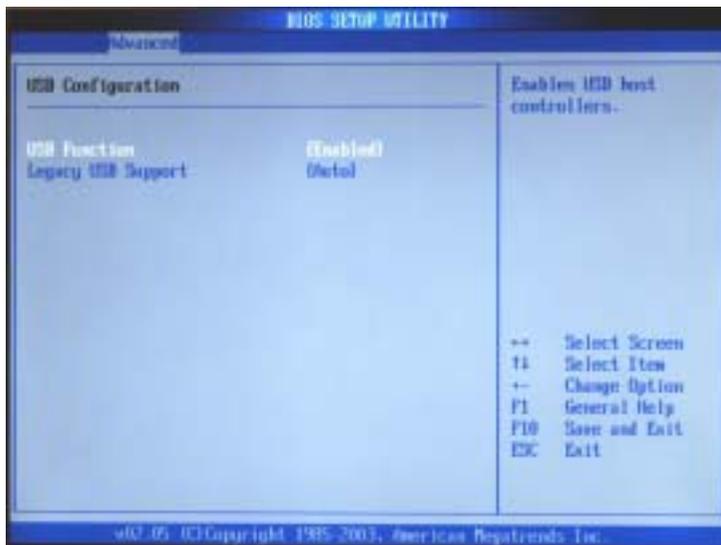
USB Function

Select "Enabled" to enable the USB Host Controller. The options are "Disabled" and "**Enabled**."

Legacy USB Support

Select "Enabled" to enable support for USB Legacy. The options are "Disabled" and "**Enabled**."

7-4 PCI/PnP Configuration

This feature allows the user to set the PCI/PnP configuration.
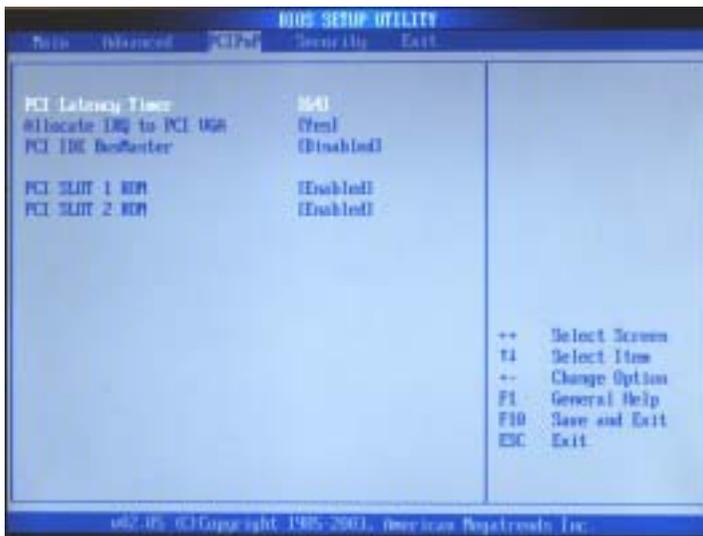
PCI Latency Timer

This option sets the latency time for all PCI devices on the PCI bus. The default setting is "**64**." Select one of the following to set latency to the desired number of PCI clock cycles: "32", "64", "96", "128", "160", "192", "224" and "248" (clock cycles).

Allocate IRQ to PCI VGA

Set this value to allow or restrict the system from assigning an interrupt request address to the VGA adapter card. The options are "**Yes**" and "No".

PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE busmastering. "Enabled" allows the BIOS to use PCI busmaster for reading and writing to IDE drives. The options are "**Disabled**" and "Enabled".

PCI Slot1 Option ROM

Select "Enabled" to enable the PCI Slot1 Option ROM function. The options are "**Disabled**" and "Enabled".

►**Hardware Health Monitoring**

H/W Health Function

Select "Enabled" to enable the Hardware Health Monitoring function. The options are "**Enabled**" and "Disabled".

Overheat Temperature Trips

This feature allows the user to set the CPU temperature threshold. The options range from "65°C" to "90°C. The default setting is "**78°C**".

7-5   Security Settings

BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.
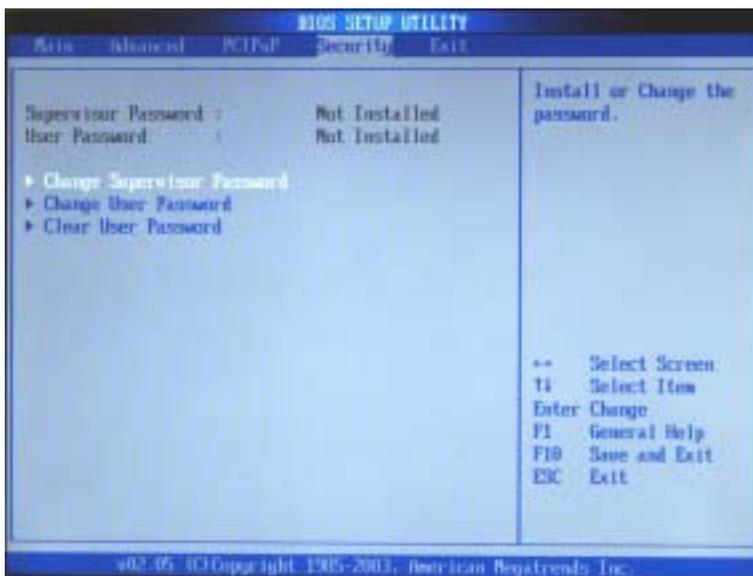
Change Supervisor Password

Select this option and press <Enter> to access the submenu, then type in the password.

Change User Password

Select this option and press <Enter> to access the submenu, then type in the password.

Clear User Password

Select this option and press <Enter> to access the submenu. You can use the sub menu to clear the user password.

7-6   Exit Options

Select the Exit tab from the BIOS Setup Utility screen to enter the Exit BIOS Setup screen.
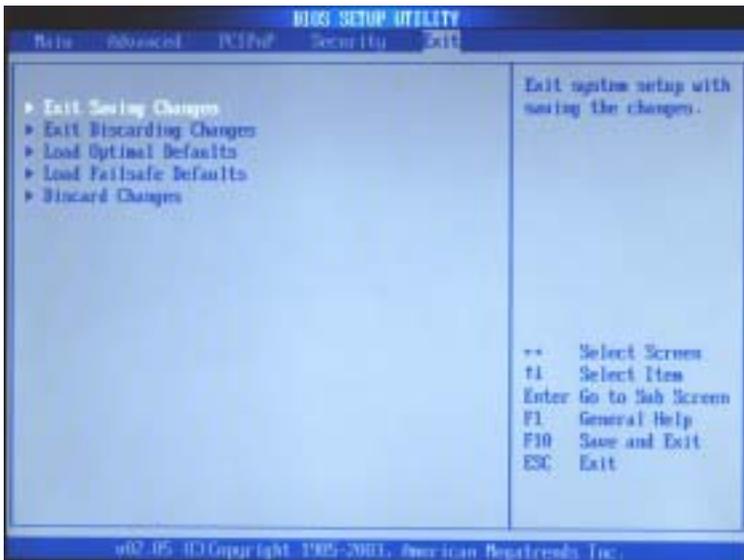
Exit Saving Changes

When you have completed the system configuration changes, select this option and press <Enter> to leave the BIOS Setup and boot the computer to allow the new system configuration parameters to take effect.

Exit Discarding Changes

Select this option and press <Enter> to quit the BIOS Setup without making any permanent changes to the system configuration and boot the computer.

Load Optimal Defaults

Select Load Optimal Defaults from the Exit menu and press <Enter> then "OK" to have BIOS automatically load all Optimal Defaults for the BIOS settings. The optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not maximum performance.

Discard Changes

Select this option and press <Enter> to discard any changes made and return to the BIOS Utility Program.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list, on the following page, correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

POST codes may be read on the debug LEDs located beside the LAN port on the serverboard backplane. See the description of the Debug LEDs (LED1 and LED2) in Section 2-6.

A-1 IA-32 Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up.)
5 short, 1 long	Memory error	No memory detected in system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory

A-2   IA-64 Common Debug Codes

Common Debug Codes for IA-64 systems are listed below:

Checkpoints		Code Description
DS4	**DS3**	
On	**On:**	SNC found and start memory sizing
On	**Off:**	Initial system memory and SIOH
Off	**On:**	Valid memory and SIOH found
Off	**Off:**	ICH4 found

Note: The debug code LEDs (DS3 and DS4) are located next to the IDE2 connector. Please refer to the serverboard layout in Chapter 5 for DS3 and DS4 locations.

Appendix B

BIOS POST Codes

When AMIBIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, diagnostic equipment can be attached to the computer to read I/O port 0080h.

Checkpoint	Code Description
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified.
D1h	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh, and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the Stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.
D6h	Control is in segment 0. Next, checking if <Ctrl> <Home> was pressed and verifying the system BIOS checksum. If either <Ctrl> <Home> was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.

Checkpoint	Code Description
03h	The NMI is disabled. Next, checking for a soft reset or a power on condition.
05h	The BIOS stack has been built. Next, disabling cache memory.
06h	Uncompressing the POST code next.
07h	Next, initializing the CPU and the CPU data area.
08h	The CMOS checksum calculation is done next.
0Ah	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next.
0Bh	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued.
0Ch	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller.
0Eh	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0Fh	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.
10h	The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command.
11h	Next, checking if <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the *Initialize CMOS RAM in every boot* AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12h	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14h	The 8254 timer test will begin next.
19h	The 8254 timer test is over. Starting the memory refresh test next.
1Ah	The memory refresh line is toggling. Checking the 15 second on/off time next.
2Bh	Passing control to the video ROM to perform any required configuration before the video ROM test.
2Ch	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2Dh	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control.
23h	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.

Checkpoint	Code Description
24h	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin.
25h	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
27h	Any initialization before setting video mode will be done next.
28h	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2Ah	Bus initialization system, static, output devices will be done next, if present. See the last page for additional information.
2Eh	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2Fh	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30h	The display memory read/write test passed. Look for retrace checking next.
31h	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32h	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34h	Video display checking is over. Setting the display mode next.
37h	The display mode is set. Displaying the power on message next.
38h	Initializing the bus input, IPL, general devices next, if present. See the last page of this chapter for additional information.
39h	Displaying bus initialization error messages. See the last page of this chapter for additional information.
3Ah	The new cursor position has been read and saved. Displaying the *Hit <DEL>* message next.
3Bh	The *Hit <DEL>* message is displayed. The protected mode memory test is about to start.
40h	Preparing the descriptor tables next.
42h	The descriptor tables are prepared. Entering protected mode for the memory test next.
43h	Entered protected mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45h	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46h	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next.

Checkpoint	Code Description
47h	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48h	Patterns written in base memory. Determining the amount of memory below 1 MB next.
49h	The amount of memory below 1 MB has been found and verified. Determining the amount of memory above 1 MB memory next.
4Bh	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.
4Ch	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4Dh	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4Eh	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4Fh	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50h	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51h	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1 MB next.
52h	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53h	The memory size information and the CPU registers are saved. Entering real mode next.
54h	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.
57h	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58h	The memory size was adjusted for relocation and shadowing. Clearing the *Hit <DEL>* message next.
59h	The *Hit <DEL>* message is cleared. The *<WAIT...>* message is displayed. Starting the DMA and interrupt controller test next.

Checkpoint	Code Description
60h	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62h	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
67h	Completed 8259 interrupt controller initialization.
7Fh	Extended NMI source enabling is in progress.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The command byte was written and global data initialization has completed. Checking for a locked key next.
84h	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85h	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.
86h	The password was checked. Performing any required programming before WINBIOS Setup next.
87h	The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88h	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.
89h	The programming after WINBIOS Setup has completed. Displaying the power on screen message next.
8Bh	The first screen message has been displayed. The *<WAIT...>* message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next.
8Ch	Programming the WINBIOS Setup options next.
8Dh	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8Fh	The hard disk controller has been reset. Configuring the floppy drive controller next.
91h	The floppy drive controller has been configured. Configuring the hard disk drive controller next.

Checkpoint	Code Description
95h	Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information.
96h	Initializing before passing control to the adaptor ROM at C800.
97h	Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next.
98h	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.
99h	Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next.
9Ah	Set the timer and printer base addresses. Setting the RS-232 base address next.
9Bh	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9Ch	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9Dh	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9Eh	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2h	Displaying any soft errors next.
A3h	The soft error display has completed. Setting the keyboard typematic rate next.
A8h	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.
A9h	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next.
Aah	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
B0h	The system configuration is displayed.
B1h	Copying any code to specific areas.
00h	Code copying to specific areas is done. Passing control to EFI.

Appendix C

Software Installation

After all the hardware has been installed, you will need to install the operating system and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your system.

C-1   Introduction to the EFI Platform

The EFI (Extensible Firmware Interface) Platform is a new firmware architecture that provides an interface between the operating system and the computer firmware (BIOS). It abstracts system data specified in the system BIOS and translates it into an object-oriented language that can be easily accessed by the OS. It also provides a rich environment for system pre-installation. EFI initializes chipset, buses and drivers and locates OS loaders. Once the EFI Firmware boots up the system, it hands over the system operation to the OS. When running in the background in the OS environment, EFI continues to provide the system with simple runtime services such as monitoring firmware settings and system reset. Due to the interoperability between the OS and the system BIOS, EFI optimizes the performance of 64-bit Itanium2 systems.

```
              ┌──────────────┐
              │      OS       │
              └──────────────┘
            Primitives  ⇕  OS Loader
              ┌──────────────┐
              │     EFI       │
              └──────────────┘
            System      ⇕  Data
            protocols      Abstracts
              ┌──────────────┐
              │     BIOS      │
              └──────────────┘
            Devices     ⇕  Drivers
              ┌──────────────┐
              │   Hardware    │
              └──────────────┘
```
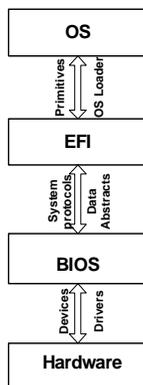
C-2   AMIBIOS Flash

1. Obtain a USB Pen or a USB storage device (a USB 2.0 device is recommended).

2. From our web site (www.supermicro.com), download the following two files into the USB pen or device: *[amiflash.efi]*, and *[*bios.rom*]*.

3. Connect the USB device to one of the USB ports (see Chapter 5 for USB port locations).

4. Bootup the system with the USB pen connected to a USB port. The system will boot to the "EFI Boot Manager". Highlight the "EFI Shell [Built-in]" field and press <Enter> to select it.

Boot to EFI Boot Manager
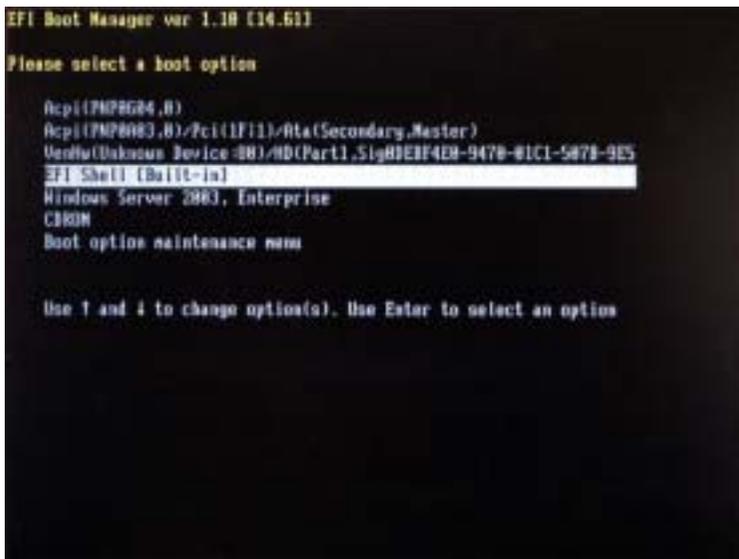
5. Once "EFI shell (Built-in)" is selected, you enter the "EFI Shell". In the "EFI Shell," locate the USB device (for example fs0 or fs1).

Location of the USB device
(example)

Locate of the USB device
(example)

6. At the shell command prompt, type: Shell> fsX: (where X is the number of the sector in which your USB pen or device is located). This command will change the directory from [Shell] to [fsX].

7. Now, start flashing BIOS by typing: fsX:\> amiflash bios.rom (where X is the sector number in which your USB pen or device is located).

8. At the "Reset NVRAM to default value? (y/n)," prompt, please choose accordingly.

9. When the fsx directory appears, type in the file name at the prompt: fsx:\ amiflash ami64.rom (eg. in the example shown above, at the prompt type fs0:\> **amiflash ami64.rom** and press <Enter> as shown below).

The system will now start loading the BIOS image file.

After the BIOS Image file is loaded, the following screen will appear:

10. When "Reset NVRAM to default value? (y/n)" is displayed, type "y" at the prompt if you want to reset all default values after flashing the BIOS. (Yes: this will reset your NVRAM, which typically resets your boot options in EFI to the manufacturer defaults. If you previously added options to boot from a CD-ROM or Windows, these will disappear after NVRAM is reset, and in this case you will have to re-add the options. No: this will leave NVRAM alone, thus your boot options will remain the same as before BIOS was flashed.) Type "n" at the prompt if you want to keep the default values after BIOS flashing as shown in the screen above.

11. When "Proceed with flash update? (y/n)" is displayed, type "y" at the prompt to update the BIOS. Type "n" at the prompt if you do not wish to update the BIOS. If you type "y", the system will automatically update the BIOS file.

12. After BIOS is updated, you will be prompted with "Reset CMOS to default values (will be done during the next boot?) y/n?. Choose "y" if you want to reset BIOS to the manufacturer's default settings during the next boot, or "n" if you only want to update BIOS without resetting it to the manufacturer's default settings. Please note that this reset will not affect EFI boot options.

13. You will then be prompted with "Reset the system? y/n?". Type "y" at the prompt if you want to automatically reboot the system.

C-3   Adding the CD-ROM Boot Option in EFI

1. Power on the system and enter the "EFI Boot Manager".

2. Select "Boot Option Maintenance Menu."

3. Select "Add a Boot Option."

4. Select "Removable Media Boot [Acpi(PNP0A03,0)/Pci(1F|1)/ ATA(Secondary,Master)]".
(Note: if your CD-ROM drive is connected to the primary IDE connector, you must choose it accordingly.)

5. Enter a new description, such as "CD-ROM".

6. When prompted with "Enter Boot Option Data", type [A-Ascii U-Unicode N-No boot Option]". Then, press <Enter>.

7. When prompted with "Enter Boot Option Data", type [Data will be stored as Unicode string:]" Then, press <Enter>.

8. When prompted with "Save changes to NVRAM [Y-Yes N-No]", press Y

9. Select the "Exit" option to exit the "Add Boot Option Menu".

10. Select the "Exit" option to exit the "Boot Maintenance Menu"

11. Once back in the EFI Boot Manager, you now can select the CD-ROM boot option to boot from the OS installation CD.

C-4   IA64 OS Installation

For installation on an IDE hard drive.

(Note: The Itanium2 board does not have a floppy connector, so the user cannot install Windows driver through a floppy device. This procedure uses ramdisk to add the boot device driver in EFI so that Windows OS will automatically pick up driver from there.)

1. Make sure that the driver for the boot device (the SCSI or RAID controller) is supported by Itanium2.

2. Copy the ramdisk.efi and driver files into a USB device (such as a USB pen). (A USB 2.0 device is recommended.)

3. Connect the USB device to a USB port and power on the system (see Chapter 5 for USB port locations).

4. Once the system enters the "EFI Boot Manager," choose "EFI Shell [Built-in]"

5. Under the "EFI Shell," locate the USB device (for example: fsx, fs0 or fs1...)

6. At the Shell command prompt, type: Shell> fsX: (where X is the number of the file in which your USB pen or device is located). This command will change the directory from [Shell] to [fsX].

7. At the new command prompt, type fsX:\> load ramdisk.efi.   T h i s command will create a virtual block inside the EFI, which contains an image of all files in your USB device including the boot device driver. This new block will be the very last block under the EFI shell. (For example, if you previously had a total of six blocks, the virtual block will be block seven [blk7].)

8. Type: fsX:\> exit. This command will exit allow you to exit the fsX device and return to the "EFI Boot Manager."

9. Select "EFI Shell [Built-in]" again.

10: At the Shell command prompt, type "Shell> copy -r blkX: blk0:". This command will copy the images from the virtual block (in this example blk7) to block 0 (blk0). Now your driver is ready to be used by the Windows OS.

11. At the Shell command prompt, type: "Shell> exit". This command will exit the EFI Shell and return to the EFI Boot Manager."

12. Select the "CD-ROM" boot option to boot from a Windows OS installation CD after you have added the CD-ROM boot option in the EFI Boot Manager.

13. Follow the OS instruction to setup the OS.

Appendix D

System Specifications

Processors

Single or dual Intel® Itanium® 2 processors of up to 1.50 GHz with a 6 MB L3 cache at a front side (system) bus speed of 400 MHz

Note: Please refer to the support section of our web site for a complete listing of supported processors. (http://www.supermicro.com/support/)

Chipset

Intel E8870 chipset

BIOS

6 MB AMI® Flash ROM

Memory Capacity

Eight 184-pin, DDR DIMM sockets supporting up to 16 GB of low-profile, registered ECC DDR200 (PC1600) SDRAM

Peripheral Drive Bays

One (1) slim CD-ROM drive

Four (4) 3.5 x 1" drive bays (for SCSI drives)

Expansion Slots (provided with riser card)

One (1) 64-bit 133/100 MHz standard PCI-X slot

Serverboard

Model: i2DML-8G2/i2DML-iG2 (Extended ATX form factor)
 Dimensions: 12.25 x 13.05 in (311 x 331 mm)

Chassis

Model: SC813HS-500/SC813Hi-500 Form Factor: 1U rackmount
Dimensions: (WxHxD) 17.2 x 1.7 x 25.6 in. (437 x 44 x 650 mm)

Weight
Gross Weight: 42 lbs. (19.1 kg.)

System Cooling
Two (2) 10-cm blower fans and one (1) high-speed 4-cm fan

System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 10A (115V) to 5A (230V)
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 500W (Model# SP502-1S, Part # PWS-0048)
Power Distribution Strip: Part# CSE-PT813-PD5i2
Rated Output Voltages: +3.3V (21A), +5V (30A), +12V (39A), -12V (1A),
+5Vsb (2A)

BTU Rating
2750 BTUs/hr (for rated output power of 500W)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 90º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2 & EN 61000-3-3,
CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4,
EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada),
TUV Certified (Germany), CE Marking (Europe)